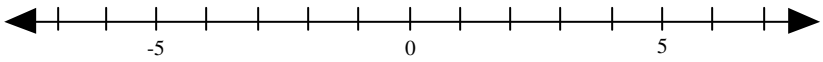
Appendix: CAHSEE Math Vocabulary

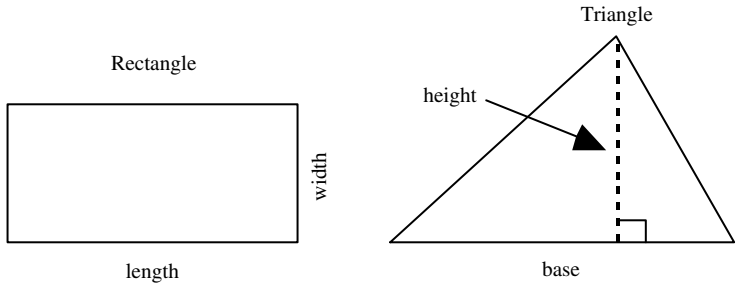
Absolute value is the distance of a number from zero on the number line. Distance is always positive or equal to zero. The symbol for absolute value consists of two vertical bars | | with a numerical value in between.



Example: | −5 | and | 5 | are both 5 because the distance from −5 to 0 is 5 units and from 5 to 0 is 5 units.

Spanish words with the same meaning as *absolute value:* valor absoluto

Area is the measurement of a surface, expressed in square units. The surface of your desktop has area; so does the state of California. The area of the desktop can be given in square inches or square feet; the area of the state of California is approximately 158,868 square miles. The areas of some shapes can be found by measuring lengths and using a formula. Below are the shapes and area formulas you'll need to know for the CAHSEE.

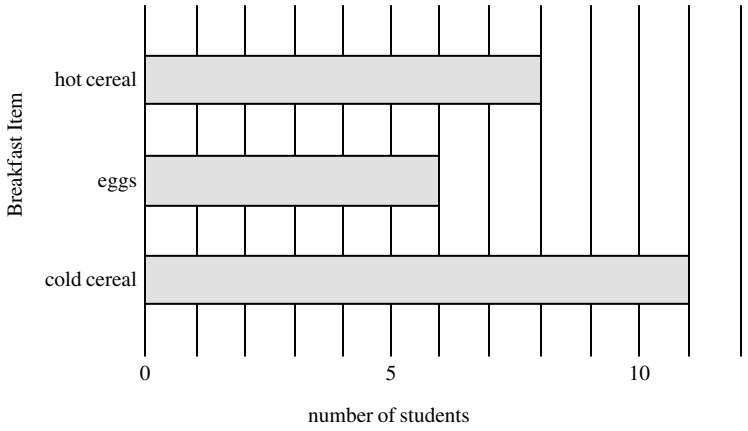


Area = length × width

Area = 1/2 of base × height

Spanish word with the same meaning as *area:* área

Bar graph refers to a way of displaying data using horizontal or vertical bars. The bars represent quantities and the longer the bar, the greater the quantity.

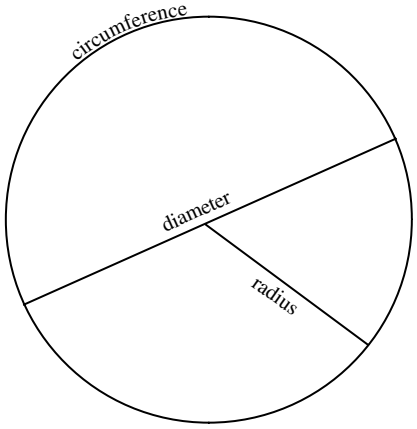


What Mrs. Gracia's students had for breakfast

In Mrs. Garcia's class, five more students had cold cereal than had eggs for breakfast.

Spanish words with the same meaning as *bar graph:* gráfica de barras

A **circle** is a plane figure consisting of all points at a given distance (the radius) from a single point (the center). This diagram shows some of the vocabulary words used with the circle.



A **diameter** is a line segment that joins two points on the circle and passes through the center.

A **radius** is a line segment that joins the center of a circle with a point on the circle. For any circle, the length of a radius is always half the length of a diameter.

The **circumference** of a circle is the length all the way around a circle. For every circle, the ratio of the length around (circumference) to the length across (diameter) is a little more than three. The exact value of this ratio, 3.14159 . . . , is called *pi*, and is usually written as the Greek alphabet character π. The formula for the circumference of a circle is $C = \pi d$ where d is the diameter. Also, because the diameter is twice the length of a radius, $C = \pi d = 2\pi r$

Spanish word that has the same meaning as *circle:* círculo

Congruent: Two shapes are congruent if they can be placed one on top of the other and all points match. This means that all matching lengths and all matching angles are the same size.

Spanish word with the same meaning as *congruent:* congruente

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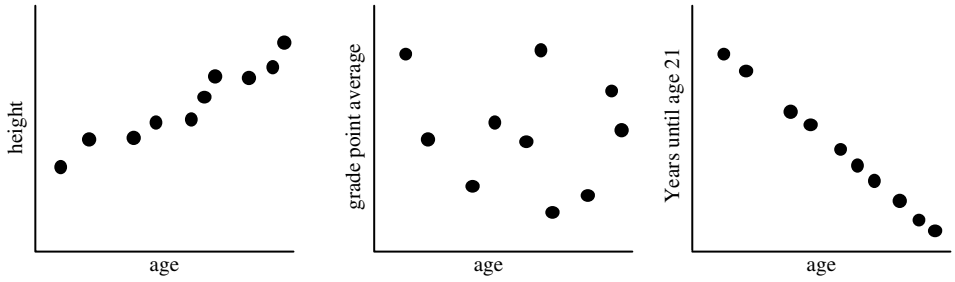
Correlation is a way of measuring how closely related two sets of paired data are to one another. The correlation may be positive, negative, or none—that is, there may be no correlation between two data sets. One way of seeing correlation is to plot the data in a scatterplot and look for a pattern.



Positive correlation | No correlation | Negative correlation

There is a *positive correlation* of student height to student age; the scatterplot shows that for this group, as the students' ages increase, their heights also increase. Between student heights and student grades there appears to be no correlation; the points have no apparent pattern.

There is a *negative correlation* between the students' ages now and the number of years until they are 21: the older they are, the fewer the number of years until they are 21.

Spanish word with the same meaning as *correlation:* correlación

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Decreased by means to make a quantity smaller by a certain number. If Marco weighs 150 pounds and he decreases his weight by 10 pounds, then he now weighs 140 pounds.

Spanish words with the same meaning as *decreased by:* disminuída por

Dependent events (See *Independent events.*)

Spanish words with the same meaning as *dependent events:* eventos dependientes

The **diameter** is a segment in a circle that goes through the center of the circle and meets the circumference at each end. (See *circle*)

Spanish word with the same meaning as *diameter:* diámetro

Equivalent expressions are numerical expressions that have the same value, or, if the expression contains variables, result in the same values for every value of the variable.

For example, $\frac{1}{4}$ is equivalent to 0.25 or $\frac{2}{8}$ or 25% or $\frac{4}{16}$ because all these expressions are the same number value.

Two algebraic expressions are equivalent if they always result in the same number value when the same numbers are substituted for the variable(s).

For example, "$5(x + y - 2)$" is equivalent to "$5x + 5y - 10$."

To see this, suppose 3 is put in for x and 4 is put in for y.

Then $5(x + y - 2) = 5(3 + 4 - 2) = 5(5) = 25$

And $5x + 5y - 10 = 5(3) + 5(4) - 10 = 15 + 20 - 10 = 25$

In fact, the distributive property tells us that these two expressions give the same number as output, no matter what values of x and y are put in.

Sometimes on multiple-choice tests, you can quickly get an idea whether two expressions are equivalent by checking the values of the expressions for a few specific numbers. This tactic is especially useful for finding out when expressions are not equivalent. If you put the same numbers in for the variables in two expressions, but different numbers are output, the you know the two expressions are not equivalent.

For example, suppose on a multiple-choice test the question is "$(x + y)^2$ is equivalent to:" and one of the possible answers is "$x^2 + y^2$." You could check to see whether these expressions are equivalent by trying 3 for x and 4 for y: Then $(x + y)^2 = (3 + 4)^2 = 7^2 = \mathbf{49}$. But $x^2 + y^2 = 3^2 + 4^2 = 9 + 16 = \mathbf{25}$. Because the two expressions give different output numbers for the same input numbers, they are not equivalent.

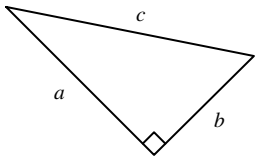
Equations or inequalities are equivalent if they have exactly the same solution set. For example, $4(x + 5) - 3(x + 2) = 14$ and $4x + 20 - 6x - 6 = 14$ are equivalent because both equations are true if and only if $x = 0$.

Spanish words with the same meaning as *equivalent equations:* ecuaciones equivalentes

Expression refers to a number, a variable, or a combination of variables, numbers and symbols. $16x^2$ and $3x + 4y$ and $25t$ and $8^{3/2}$ are all expressions.

Spanish word with the same meaning as *expression:* expresión

The **hypotenuse** in a right triangle is the side opposite the right angle. The Pythagorean theorem for right triangles is sometimes given as "$a^2 + b^2 = c^2$." In this formula, the a^2 and b^2 are the squares of the legs and the c^2 refers to the length of the hypotenuse squared.



Hypotenuse and right angle

Spanish word with the same meaning as *hypotenuse:* hipotenusa

Independent events, dependent events: These terms are used when figuring probabilities. In probability, an *event* is a particular happening that may or may not occur. Some examples of events are: "A fair coin will come up heads on the next flip," and "Rain will fall in Oakland tomorrow," and "Trudy Trimble will win next week's California lottery."

One event is said to be *independent* of another if the first event can occur with absolutely no effect on the probability of the second event's happening. For example, suppose you are going to flip a fair coin two times and on the first flip it comes up heads. On the second flip, the probability of the coin coming up heads is still 50%. Each flip of the coin is *independent* of all other flips.

But some events are *dependent;* that is, the probability of one event depends on whether the other event occurs. For example, suppose you are randomly choosing two marbles, one after another, from a bag that contains three blue marbles and three red marbles. On your first draw, you have a 50% chance of drawing a blue marble. But on your second draw, the probability of drawing a blue marble depends on which color you pulled out on the first draw. The probability of getting a blue marble on your second draw is *dependent* upon the result of the first draw.

Spanish words with the same meaning as *independent events, dependent events:* eventos independientes, eventos dependientes

Integers are the set of whole numbers and their opposites: $\{\ldots -3, -2, -1, 0, 1, 2, 3, \ldots\}$

Spanish word with the same meaning as *integers:* enteros

To find the **mean** of a set of data, first find the sum of the numbers in the data set and then divide the sum by how many numbers there are in the set.

Example: Using the set of data as follows: {23, 12, 6, 4, 5, 12, 2, 11, 12, 5, 1, 8, 3}, the sum of the numbers is 104. There are 13 numbers in this set and 104 divided by 13 is 8. Therefore, the *mean* is 8. Notice that the median and the mean may not necessarily be the same value, even though both are sometimes referred to as the "average."

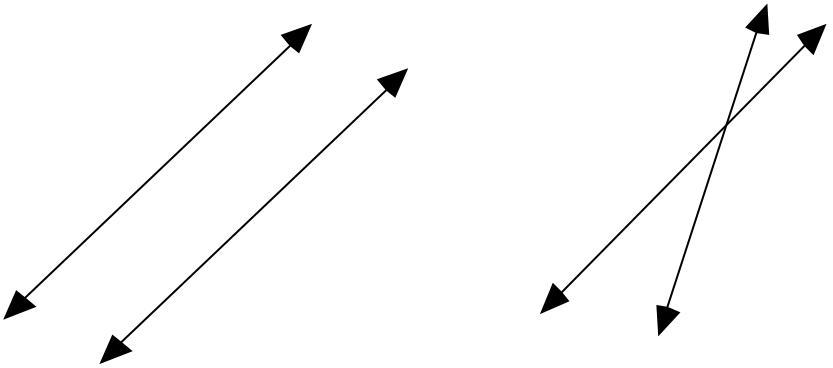
Spanish word with the same meaning as *mean:* medio

The **median** is the middle data item, where the data are arranged from least to greatest. For a data set with an even number of data items, to find the median you add the two middle data values and divide by two.

Example: Using this set of data from the preceding example, {23, 12, 6, 4, 5, 12, 2, 11, 12, 5, 1, 8, 3}, first arrange the data in order from least to greatest: {1, 2, 3, 4, 5, 5, 6, 8, 11, 12, 12, 12, 23}. The median is 6, because it is the middle number.

Spanish word with the same meaning as *median:* mediano

Parallel: straight lines or planes that never intersect.

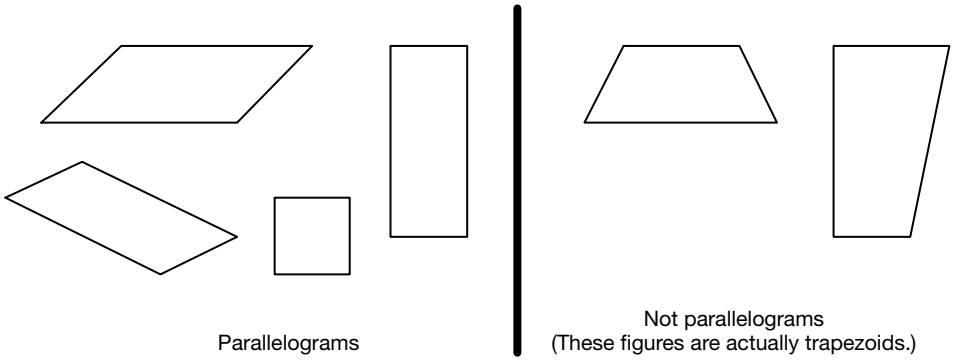


Parallel lines

Lines not parallel

Spanish word with the same meaning as *parallel:* paralelo(a)

A **parallelogram** is a four-sided geometric figure, with each pair of opposite sides being parallel.



Parallelograms

Not parallelograms
(These figures are actually trapezoids.)

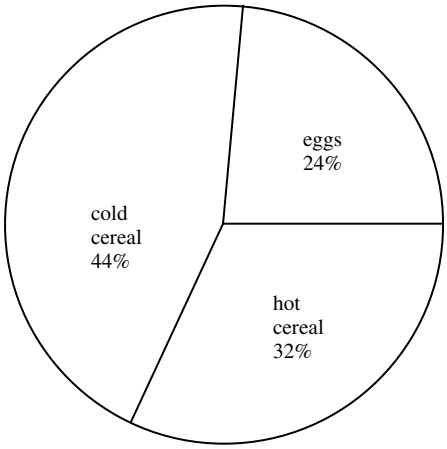
Spanish word with the same meaning as *parallelogram:* paralelograma

The **perimeter** is the distance around any closed, geometric, two-dimensional shape.

Spanish word with the same meaning as *perimeter:* perímetro

A **pie chart** (or **circle graph**) is a way of displaying numerical data by dividing a circle into sectors. Each sector represents a category of the data and the size of each sector represents the relative size of that category compared to the whole. The parts are usually identified as percents of the whole.

Here is a way of showing the breakfast data for Mrs. Garcia's class in a circle graph.



Spanish words with the same meaning as circle *graph:* gráfica circular

A **prime number** is a number that has exactly two factors: itself and 1.

The smallest prime is 2, because only $2 \times 1 = 2$; 7 is a prime number, because only $7 \times 1 = 7$; 9 is *not* a prime number because 9 has three different factors: 1, 3, and 9.

Spanish word(s) with the same meaning as *prime:* primo (número primo)

The **probability** of an event's happening is a number from 0 to 1, which measures the chance of that event happening. The probability of most events is a value between 0 (impossible) and 1 (certain). A probability can be written as a fraction, as a decimal or as a percentage.

Spanish word with the same meaning as *probability:* probabilidad

The **radius** of a circle is the segment that begins at the center of the circle and ends at the circumference. Its length is half the diameter. (See *circle.*)

Spanish word with the same meaning as *radius:* radio

To choose **randomly** from a set means that each item of a set has an equal chance of being chosen.

Spanish word with the same meaning as *randomly:* aleatoriamente

Scatterplot is a two dimensional graph in which each point stands for two related items. For examples of scatterplots, see *correlation.*

Spanish word with the same meaning as *scatterplot:* dispersograma

Scientific notation is a way of writing numbers as a product of a power of 10 and a number greater than or equal to 1 but less than 10. Scientific notation gives us a way of writing very large numbers or very small numbers. Scientific notation uses powers of 10 to move the decimal point to the right or left.

For example $1.5 \times 10^6 = 1{,}500{,}000$ and $1.5 \times 10^{-6} = 0.0000015$

In scientific notation, 8,906,000 is 8.906×10^6 and 0.0000023 is 2.3×10^{-6}.

Spanish words with the same meaning as *scientific notation:* notación científica

Simple interest: When you have a savings account, the bank pays you for the use of your money. This payment is called interest. When the term simple interest is used, it means that the interest is calculated by finding the product of the original amount of money, the interest rate, and the time the money is in the bank.

For example, suppose you put $200 in a bank that pays 8% per year for 3 years. Then the simple interest is $\$200.00 \times 0.08 \times 3 = \$48$.

Spanish words with the same meaning as *simple interest:* interés simple

Slope of a line on a graph is the ratio of the change in *y*-values to the change in *x*-values between any two points on the line.

Spanish word with the same meaning as *slope:* pendiente

The **square** of a number is the product of a number multiplied by itself. The square of 4 is 16 because 4×4 is 16. To square 13 means to multiply 13×13, which is 169.

The symbol is the exponent ^{2}. $4^2 = 16$ and $13^2 = 169$.

Spanish word with the same meaning as *square:* cuadrado

Square root is the opposite, or undoing, of squaring a number. Because $4^2 = 16$, then the square root of 16 is 4. Because $13^2 = 169$, then the square root of 169 is 13. The symbol for square root is $\sqrt{\ }$, so $\sqrt{9}$ is 3, because $3^2 = 9$.

Spanish words with the same meaning as *square root:* raíz cuadrada

The **surface area** of a solid is the sum of the areas of all the faces of the solid. If the solid is curved like a cylinder or cone, the surface area can be found by unfolding the surface to make it flat and finding the area of the flat figure.

Spanish words with the same meaning as *surface area:* área total

A **trapezoid** is a geometric figure with four sides where exactly two of the sides are parallel. (see *parallelogram*)

Spanish word with the same meaning as *trapezoid:* trapezoide

The **volume** of a figure such as a rectangular solid, cylinder, cone, or sphere is a measure of the amount of space inside the figure. Volume is measured in cubic units.

Spanish word with the same meaning *volume:* volumen

The ***y*-intercept** is the value of *y* in an ordered pair that describes where the graph of the line intersects the *y*-axis. When a *y*-intercept is written as an ordered pair, a "0" will always be in the first spot because the *x*-value must be 0 there. For example a *y*-intercept of "5" has coordinates (0, 5).

Spanish words with the same meaning y-*intercept:* intercepción y

Notes

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